pear and the patient is comparatively well until the following spring which ushers in another attack. In these succeeding attacks the erythema usually is not so severe yet the permanent changes become more marked. The gastro-intestinal and mental symptoms becoming more severe. The increase in the salivary secretion and gastro-intestinal symptoms being particularly marked. Melancholia or dementia develop and the patient, after an unhappy existence, develops oposthotonos, and he dies from exhaustion.

I have made no attempt to go into the differential diagnosis, the nervous phenomena as the result of chord degeneration, the morbid anatomy nor the treatment, as these points are exhaustively treated in our text books, and particularly in a recent article, with excellent illustrations, by Hyde. If this brief description will increase your pleasure in examining this patient, I shall indeed be grateful.

Discussion.

Dr. H. D'Arcy Power, San Francisco: The only thing which I desire to say is that I am more and more impressed, the more I have seen of actual cases recently, with the idea that we have all had these cases before us many times without recognizing them. From the time I saw the first case exhibited by Dr. Blue, it has been easy for me to go back in my mind over my past records and recall at least 2 cases, which were undoubtedly cases of pellagra, of whose nature I then had no idea. I am quite sure that if we all pay attention to cases now under our observation we will find many of these cases. I am pretty sure that pellagra is not such a recent importation as some imagine. Another point of which I wish to speak is the importance of getting more knowledge than we have in regard to its etiology. There is much in the general character of the distribution of pellagra to suggest that the fundamental trouble is in the nervous system, that it is a neurosis finding its expression in lesions of the skin and mucosa. Until we know more concerning the nature and mode of action of the poison we have no chance of dealing with it therapeutically. The first thing of importance, then, is that we all learn as much as possible of the disease with a view of its better recognition and secondly to learn more concerning the etiology with the view of finding the right treatment.

Dr. Creighton Wellman, Oakland: I have examined both the cases presented by Dr. Clark. One is without question a case of pellagra although the eruption is far from typical—it lacks the classical sharpness of outline. The line of demarcation should be definite where the sleeve ends and above the collar bands. I think that the matter of eruption in these cases has been emphasized too much. It is one of the minor characteristics of the disease. All of the symptoms in all the textbooks have been printed under the description of pellagra but the details of the symptom complex are not always important. You have the general nervous condition which simulates very closely general paralysis of the insane. You have also the denuded condition of the intestinal tract from the mouth to the anus. The symptoms accompanying this condition can be imagined. The stools are rather characteristic, of markedly foul odor and of a peculiar greenish yellow color. A striking thing is the denudation of the buccal surfaces, the so-called cardinal tongue, etc.

Dr. W. A. Clark, San Leandro: As to the etiology of pellagra, we know nothing definitely as yet. Most authorities lean toward maize in corn eating countries. Whether some specific organism is the cause, I do not know. The skin lesion in these cases is possibly the least important thing which we have to consider. The gastrointestinal and nervous symptoms are the predominating ones. Another important fact is the mental condition of these patients. This man, who undoubtedly has pellagra, was received in our wards as a melancholic—which is probably the final expression of the disease. In looking back over the period of time during which I have been at the County Hospital, I remember several of these cases of low mentality showing the expression of a disease such as this. I could never understand why it was that these people during the spring months were subject to such severe types of sunburn. I am under the impression now that these must have been cases of pellagra. In the second case which I showed, which is only a border line case, the arteries are quite good, the heart is quite good and the nervous symptoms are the most pronounced. The absence of the superficial and deep reflexes cannot be explained quite satisfactorily unless the man has pellagra. Those of us who have charge of the county hospitals and asylums may be able to look back over some of our cases of melancholia, and now diagnose them as pellagra. I have no doubt but that the friends and relatives of these so-called melancholic patients, who have been discharged, have accused us of abusing these patients, judging from the looks of the skin lesions. An interesting and important feature is that these skin lesions do not disappear after death.

HISTORY OF RABIES IN SOUTHERN CALIFORNIA.

By STANLEY P. BLACK, M. D., and L. M. POWERS, M. D., Los Angeles.

There is no disease, perhaps, in which the public mind is so beclouded as with that of hydrophobia. The general public often denies the existence of the disease and even among the profession we have seen doctors who say they never saw a case of rabies, and who state therefore it does not exist. Rabies is a disease which affects many animals, most commonly dogs, and more rarely the human being, but Drs. Kerr and Stimson in their paper read before the American Medical Association, had collected 111 human deaths from hydrophobia in 1908. Every dog which bites an individual is not a rabid dog. It may be angry but not hydrophobic. On the other hand a large proportion of the hydrophobic dogs are unable to bite. We have the disease in the dog in two forms. First and most common the dumb variety, in which the lower jaw is paralyzed. The dog is usually quite nervous, oftentimes very affectionate, but the drop of the lower jaw is quite characteristic. In the other variety we have the furious type in which the dog will bite anything coming in his way. He rarely fights, but bites and passes on. Before the days of the modern diagnosis of hydrophobia, the large proportion of cases of rabies was diagnosed from autopsy, opening the stomach and finding it full of sticks and stones. For the past few years we have been using the microscope in the study of rabies, finding in the brain within the cells of the Hippocampus or Ammon's Horn and in other parts of the brain, the Negri bodies. These bodies as shown here under

* Read at the Fortieth Annual Meeting of the State Society, Sacramento, April, 1910.

the microscope are pink or red oval bodies varying in size, with small blue granules of basophilic nature, lying within the nerve cells. In California the people have been congratulating themselves that rabies did not exist in the State. We desire, therefore, to call attention to the epidemics which have occurred in the southern end of the State.

Prior to 1898 the oldest citizen in this part of the State did not remember ever having heard of rabies existing in Southern California. The first case seen and diagnosed clinically as rabies in a dog in the city of Los Angeles was reported to the health office by the owner, an English gentleman who resided near Third and Flower streets, whose dog was chained up but broke loose, seemed very nervous and uncontrollable, and fought other dogs in the neighborhood with which he had previously been on good terms, and it became necessary to shoot him. Four or five other dogs were reported to the health office in the course of a few weeks as having rabies, some with the dumb form and others with the furious form. The diagnosis of most of these cases were made by the late Dr. Withers, founder and former president of a Chicago veterinary school. In one of these cases his diagnosis was confirmed by animal experimentation made by one of us. Upon recommendation of the city Board of Health a muzzling ordinance was passed by the city council, February 23, 1898. This ordinance provided that all dogs running at large on the streets or other public places, whether licensed or not, were required to be muzzled by means of an efficient muzzle which would prevent the dogs from biting other animals or human beings. The police and the dog-catcher were empowered to enforce this ordinance. The latter official at that time was paid a stated sum for each dog caught and held or destroyed by him. This ordinance was enforced, and a few weeks afterward no rabid dogs were seen in the city. In less than three months, as there was no longer any evidence of the disease existing, upon the recommendation of the Board of Health the city council repealed it.

The source of this infection we have never been able to satisfactorily ascertain. Since then it has been reported to the health office that there were several rabid dogs just southeast of the city about the period just referred to, and the suspected source of infection to these dogs was supposed to be from some stray or abandoned dogs left on a ranch near the river, and which had been for some time prowling around and making a precarious living by preying upon the neighboring ranches, visiting the city for garbage, etc. It is possible that the dogs referred to received their infection from wild animals, and, as we are informed by the territorial authorities, the disease had existed for years among the skunks and coyotes in Arizona, there is every reason why it should spread to Southern California.

In the spring of 1899 occurred in Pasadena the following human case of hydrophobia. This report was written at the time by the attending physician, Dr. J. M. Radebaugh:

On March 10, 1899, H. M. S. was bitten on the right ala of the nose by his cocker spaniel. This dog had previously bitten the puppy of his mate, and the four-year-old son of the patient. From March 10th to April 25th Mr. S. exhibited some restlessness, and an abnormal desire for diversion. On April 25th intense migraine in the side bitten. As this subsided somewhat under treatment faucial injection of same side was noticed. Two days later, in attempting to drink water, a spasm of the arm kept the glass six inches from mouth, and spasm of throat muscles occurred. Shortly afterward was able to swallow water through a tube, and still later by taking two forced inhalations was able to swallow water, followed, however, by spasm of throat muscles. Patient highly excitable and talkative. These symptoms continued for three days; the muscular spasms gradually extended over the entire body. Profuse tenacious mucous secretion in throat causing great efforts at clearing throat. Patient had the feeling that he could not expectorate into a cloth or vessel, but must spit to a considerable distance. Opisthotnos finally developed, and death occurred April 30, 1899. An autopsy was made by one of us at the request of the family in order that, if the diagnosis was established by animal inoculation, the four-year-old son of the patient might receive the Pasteur treatment.

The brain, except for meningeal injection, showed no gross lesions. Subdural injections into two rabbits of an emulsion of the medulla of the patient were made. These rabbits died during the second week with typical symptoms of dumb rabies.

At this time no other cases of the disease were observed in or about Pasadena either by physicians or veterinarians. The health officer of the city at that time, Dr. F. F. Rowland, could find no other cases in other animals. Some two or three weeks previous to biting Mr. S., this dog had been away from home for a couple of days, and had probably at that time been infected.

From 1899 to 1906 no case was observed by either of us. In the spring of 1906 one of us was asked to go to Soldiers' Home, twelve miles southwest of Los Angeles, where the following facts were given: A pet dog of one of the officers had acted strangely, and on March 31st bit a man, five horses, several dogs and hogs. On advice of Dr. Antonio Lagorio, director of the Pasteur Institute, Chicago, the head of the dog was placed in glycerin and taken to Chicago by the patient. Dr. Lagorio found Negri bodies present, and gave the man the Pasteur treatment. Rabbits inoculated from the brain of this dog died of rabies. The dogs bitten at Soldiers' Home were immediately killed; the horses quarantined and later two of the latter developed rabies and also a large hog, which were killed.

In June, 1909, a policeman shot a collie dog at San Fernando and Ord streets, Los Angeles, near the center of the city, which he suspected of being rabid. The brain was examined in the Los Angeles laboratory with negative results. In less than a month after this three other dogs suspected of being rabid were shot by policemen within four or five

blocks of the same neighborhood. In September of the same year Mr. Petersen, of Ellendale and Twenty-third streets, in the southwestern portion of the city, reported to the health office that a valuable horse owned by him had symptoms that created suspicion in his mind; and on investigation it was found that the horse had been bitten by a strange sick dog about three weeks before. The horse showing all clinical symptoms of rabies was pronounced clinically rabid by the attending veterinarian, Dr. L. W. Young. The horse died, and its brain was secured and examined in the city laboratory, and showed Negri bodies. The next animal examined was a black water spaniel at No. 3556 Arroyo Seco avenue, in the northeastern corner of the city, in the direction of Pasadena. As examined by one of us the brain of this dog showed Negri bodies; and in the city laboratory inoculations were made of guinea pigs and rabbits which proved rabies. A muzzling ordinance was passed on September 15, 1909, but was repealed the following Tuesday in consequence of strong opposition by part of the board of health, a few dog lovers, and the humane animal officer. The disease then rapidly spread over the city, and many cases of rabid dogs were reported from various parts of the city. Up to the present time there have been reported to the health office forty-three dogs; and the brains of thirty-nine dogs and other animals have been examined at the city laboratory. Four horses and one mule to our knowledge have died of rabies. The total number of persons bitten by rabid dogs is unknown.

The city does not employ a veterinarian, and on account of public sentiment it has been with the greatest difficulty that the Health Department has received reports of cases. In fact, we do not believe there has been one case of rabies in ten reported to the office. Many dogs are killed by their owners or other persons and sent to the crematory without any diagnosis having been made by a veterinarian, or any examination of the brain.

Dr. John R. Colburn reported a case of rabies in a human being February 21, 1910, an account of which appeared in the *Southern California Practitioner* as follows:

"Patient, J. S., age 10 years, was bitten, while playing in the street, on the calf of the leg by a stray dog about December 17, 1909, and developed rabies and died February 21, 1910. February 18th the child seemed unwell and complained of intense itching, and was very restless. February 20th had passed a restless night, and was unable to swallow the castor oil given to him by his mother about 2 a. m.; pulse intermittent; no rise in temperature. February 21st, at 2 a. m., patient extremely restless, rolling in bed, jumping up, talking constantly, spitting frequently, crying out as if in pain; cold perspiration; pulse thready, about 180 per minute; had not been able to swallow any liquid for twenty-four hours.

"It became necessary to restrain the patient during attacks of extreme restlessness, which were caused by any sudden noise, draught of air, or an attempt to swallow any liquid. These attacks lasted about three minutes, and were preceded by twitchings of the muscles of the face, chest and arms with a delerious laugh. When quiet answered all questions promptly and intelligently. At 8:30 a. m. became comatose, and died at 9:45 a. m.

"One of us made an autopsy, examined the brain, and found Negri bodies."

In November, 1909, the city veterinarian of Pasadena called our attention to a dog which he considered rabid. This dog, a great pet, exhibited the typical lower jaw paralysis and marked restlessness. The diagnosis was concurred in, and the dog was killed. Microscopic examination of the brain showed typical Negri bodies. During the next six days eight rabid dogs were observed. The Board of Health requested the city council to pass an ordinance requiring the muzzling of all dogs running upon the streets. This request was denied by the council. The epidemic kept up at the rate of one to three cases a day for the next month. Then the Board of Health in a body attended the meeting of the council, and with the action and co-operation of the mayor succeeded in securing the desired ordinance. During the next six weeks about seventy rabid dogs and one rabid cat were observed by the veterinarians of Pasadena. At the end of two months no further cases were reported, and at the end of three months the ordinance was repealed at the request of the Board of Health; and since then no further cases have been reported.

During the present epidemic cases of the disease in dogs and cats have been diagnosed microscopically by one of us or by the State Hygienic Laboratory at Berkeley in the following districts around Los Angeles: Hollywood (now annexed to Los Angeles), Glendale, Long Beach, South Pasadena, Covina, Santa Ana, Redlands, Monrovia and Santa Monica.

Discussion.

Dr. Charles Kean, State Veterinarian, Sacramento: There are so many fallacious ideas regarding the disease of rabies that it is no wonder that the laity still believes that this disease does not exist. I might add to Dr. Black's paper that the disease exists in Northern California and that in and around the city of Stockton they have had 100 cases during the past four or five months. The muzzle ordinance has been enacted. We have the two forms of rabies —the dumb type and the furious type—and this is where the trouble comes in with the layman and the professional man. The common idea with regard to rabies is that a dog should be running around biting at everything and everybody. This is the case in the furious type but not in the dumb type of the disease. Wherever we have a rabies epidemic, the prevalent type is the dumb type. Where we have one case of the furious type we have ten or twelve of the dumb type. In the dumb type, the symptoms which are most usual are the paralysis or paresis of the lower jaw and paralysis of the muscles of deglutition, constantly increasing, followed by death in from three to six days. In the furious type we also have a certain amount of paresis of the lower jar. These dogs will leave home for several days and will fight and attack other animals as well as man and foreign bodies such as sticks and stones are found on autopsy in the stomach. In connection with rabies these dogs usually show an exact opposite change of nature as soon as the disease is developed. The disease appears in dogs sooner after inoculation than in any other animals, sometimes as early as six days after inoculation. Unfortunately the first symptoms are not noticed. This disease is very often mistaken for distemper, strychnin poisoning and tetanus. The symptoms, however, give such a perfect picture that I cannot understand its not being diagnosed.

Dr. H. G. Brainerd, Los Angeles: My experience with rabies is very limited. I saw in consultation this case which Dr. Black reported and might say a few words in that connection. The boy had attended school the Friday before I was called and was noted to be nervous and complaining. There was no urticaria or itching or burning over the entire surface of the body. He slept but little but had no definite pain. His restless condition was ascribed to the fact that he had been the only child in the house to have escaped the measles. He was kept in bed the following days, and while the restlessness continued he talked perfectly rationally but had some difficulty in swallowing his food. He was constantly talking and spitting a dry and tenacious secretion in small amounts. He said he wanted a drink and for the first time I noticed the characteristic spasm preventing the swallowing. The moment the water was in his mouth there was a spasm of the pharynx which prevented his swallowing. He died about four hours after I first saw him, with heart failure, and whether that rapid heart action was due to the stimulants which he had had or to the disease, I do not know.

Dr. S. W. Langdon, Stockton: It has already been referred to in this discussion that we have had rabies in Stockton. About 100 cases have been reported. It is now the custom that when there is anything found to be the matter with the dog either the people or the police kill it. About forty cases have been actually under the observation of the veterinarian. Out of that number fully one-half had typical symptoms. In the other half the symptoms were not typical but the cases were surely rabies. The heads of several of these dogs were sent to the State University Laboratory and pronounced to be rabies. Nearly all of these dogs were affected with the dumb type of the disease. There were only four or five with the furious type, and by some good luck no one was bitten by any of these dogs. Of course, the fact that no one was bitten had quite a tendency to disprove that it was rabies. Our Supervisors were asked to appoint a veterinarian, but refused. They thought it was the object of some one to get a job, and that was the attitude with which we had to contend. If any of you get it in your community, I advise you, when you are having your ordinance drawn up, to be specific with regard to muzzles, being sure that they are sufficient. There are muzzles which allow the dogs to nip people and my idea is that they should be of wire, which is no injury to the dog.

Dr. E. Rixford, San Francisco: In the absence of Dr. Beatty of San Jose, I will mention a few details of an interesting case which he had. You may remember having heard of the case of Miss Kennedy, a school teacher, who was pounced upon by a California lion. The animal held her in his grasp with his foreclaws on her shoulders and every time she moved or screamed his claws were tightened. After the lion was shot it was found that Miss Kennedy was not seriously wounded and under Dr. Beatty's care she recovered. Some three or four weeks subsequently she developed certain nervous symptoms not easily explained and ending in death. Dr. Beatty was much of the opinion that this was a case of hydrophobia in the wild animal. It may be interesting to know that the wild animal may be infected and may be the source of infection.

Dr. L. M. Powers, Los Angeles: When we announced that we had rabies in Los Angeles as early as 1899, it was disputed by everybody. We succeeded in proving it and under the existing conditions very readily wiped it out. The muzzle ordinance eradicated the disease. No more was heard of it after that until six or seven cases were seen at the Soldiers' Home more recently. There is, however, such a feeling against believing in this disease that it is difficult to get an ordinance passed. We made our appeal time and time again and it was denied, and we patiently waited hoping that the dog would bite the right person. He bit, but it was a child and the child died. The ordinance was then passed but not sufficiently enforced to get the results we desired. In the first place, the public is not sufficiently educated on this subject. They do not understand it. If we can control the dog, we can eradicate the disease from the community. The greatest trouble we have is with the humane feeling existing among people against administering the law. They will protect the dog in spite of the child. Under the present system of enforcing the muzzling ordinance, the humane officer and the police are more or less hampered. Another thing is that the humane officer at the present time is hired by the month. It used to be that he was hired by the job and naturally took more interest in the work he did. Rabies is described by some authors in several stages, the dumb form being preceded by a rabid form. I have noticed in some dogs that while they have remained perfectly docile, they have become very rabid on examination. There was one dog which had been perfectly quiet until the night before he was shot, when he suddenly tore up a pair of shoes. When I saw him it was almost impossible for him to bite. In other dogs, we would imagine from his actions that he is choking or has a bone in his throat. One dog which I saw, while not disposed to hurt anybody, was inclined to take his forepaw every once in a while and claw his mouth three or four times and then lie down quietly again until something disturbed him. Actions of this kind have led people to undertake to remove bones, and they have been bitten by this seemingly gentle animal.

THE DEMONSTRATION OF A DISSECTION SHOWING AN ANOMALY OF THE ARTERIES OF THE LEG, WITH AN INTERPRETATION.*

By FRANK E. BLAISDELL, M. D., San Francisco.

In the dissection the arteries of the leg all arise normally, but the anterior and posterior tibials both terminate in the lower third of the leg, by breaking up into small terminal branches, neither passing into the foot.

All the arteries to the foot are supplied by the peroneal.

The anterior branch of the peroneal passing forward between the tibia and fibula, gives off the anterior peroneal and continues onward into the dorsum of the foot as the dorsalis pedis, which is normally distributed.

The peroneal proper gives off its usual branches at the posterior and outer ankle, passing to the inner ankle, dividing there into the two plantar arteries, which are otherwise normal in their distribution in the foot.

The artery of the embryonic lower extremity is the sciatic, a direct continuation of the common iliac; it develops in the back of the limb as that develops, supplying branches to the foot; giving off a branch just below the knee (proximal part of the future anterior tibial), another just above the ankle (distal part of the anterior tibial).

Meanwhile the femoral artery has appeared as an outgrowth at the junction of the sciatic with the common iliac. The femoral extends caudad beneath the inguinal ligament and forms an anastomosis with the sciatic just above the knee, the sciatic in the leg now becomes continuous with the femoral (popliteal and peroneal); another branch

* Read before Cooper College Science Club.